CLAIMS

1.   A method of hemodynamically optimizing pacing intervals in a cardiac stimulation therapy device that provides pacing therapy to at least three chambers of a heart, comprising:

>   a) measuring developing fluid pressure with a pressure sensor adapted to be coupled to a cardiac chamber and providing a pressure signal therefrom for at least one cardiac cycle;
>
>   b) storing at least a one of 1) the pressure signal or 2) a temporal derivative of the pressure signal, and a then-present pacing interval set used when the pressure signal was measured;
>
>   c) changing at least two pacing intervals of said pacing interval set, and
>
>   d) returning to step a) until each of the at least two pacing intervals have been changed;
>
>   e) comparing the stored pressure signal or the temporal derivative of the pressure signal corresponding to said at least two pacing intervals to the stored pressure signal or the temporal derivative of the pressure signal corresponding to ; and
>
>   f) utilizing a present pacing interval set that includes the at least two pacing intervals that provided the most favorable pressure signal or temporal derivative of the pressure signal when compared in step e).

2.   A method according to claim 1, wherein the pressure sensor comprises an absolute pressure sensor coupled to an ambient pressure reference unit.

3.   A method according to claim 1, wherein the chamber is a right atrial chamber or a right ventricular chamber.

4.   A method according to claim 1, wherein said pressure sensor is coupled to a pacing lead.

5.   A method according to claim 1, wherein said pressure sensor is coupled to a defibrillation lead.

6.   A method according to claim 1, wherein said pacing intervals comprise at least a one of: an A-A interval, an A-V interval, a V-A interval, a V-V interval, a sensed-AV interval, a paced-AV interval.

7.   A method according to claim 1, wherein said pacing intervals include a paced heart rate value.

8.   An apparatus for hemodynamically optimizing pacing intervals in a multi-chamber cardiac stimulation therapy device that provides pacing therapy to at least three chambers of a heart, comprising:

    means for measuring developing fluid pressure with a pressure sensor
        adapted to be coupled to a cardiac chamber and providing a
        pressure signal therefrom for at least one cardiac cycle;

    means for storing at least a one of 1) the pressure signal or 2) a
        temporal derivative of the pressure signal, and a then-present
        pacing interval set used when the pressure signal was
        measured;

    means for changing at least two pacing intervals of said pacing interval
        set, and

    means for returning to the initial step until each of the at least two
        pacing intervals has been changed;

    means for comparing the stored pressure signal or the temporal
        derivative of the pressure signal corresponding to said at least
        two pacing intervals; and

    means for utilizing a present pacing interval set that includes the at
        least two pacing intervals that provided the most favorable
        pressure signal or temporal derivative of the pressure signal
        when compared by the means for comparing.

9.   An apparatus according to claim 8, wherein the pressure sensor comprises an absolute pressure sensor.

10.   An apparatus according to claim 8, wherein the chamber is a right atrial chamber or a right ventricular chamber.

11.   An apparatus according to claim 8, wherein said pressure sensor is coupled to a pacing lead.

12.   An apparatus according to claim 8, wherein said pressure sensor is coupled to a defibrillation lead.

13.   An apparatus according to claim 8, wherein said pacing intervals comprise at least a one of: an A-A interval, an A-V interval, a V-A interval, a V-V interval, a sensed-AV interval, a paced-AV interval.

14.   An apparatus according to claim 8, wherein said pacing intervals include a paced heart rate value.

15.   An apparatus according to claim 8, wherein the pressure signal represents at least a one of: an ePAD metric, a pulse pressure metric, a right ventricular systolic pressure metric, a right atrial systolic pressure metric, a right ventricular diastolic pressure metric, a right atrial diastolic pressure metric.

16.   A method according to claim 1, wherein the pressure signal represents at least a one of: an ePAD metric, a pulse pressure metric, a right ventricular systolic pressure metric, a right atrial systolic pressure metric, a right ventricular diastolic pressure metric, a right atrial diastolic pressure metric.

17.   A computer readable medium for storing instructions for performing a method of hemodynamically optimizing pacing intervals in a multi-chamber

cardiac stimulation therapy device that provides pacing therapy to at least three chambers of a heart, comprising:

instructions for measuring developing fluid pressure with a pressure sensor coupled to a cardiac chamber and providing a pressure signal therefrom for at least one cardiac cycle;

instructions for storing at least a one of 1) the pressure signal or 2) a temporal derivative of the pressure signal, and a then-present pacing interval set used when the pressure signal was measured;

instructions for changing at least two pacing intervals of said pacing interval set;

instructions for returning to the initial step until each of the at least two pacing intervals has been changed;

instructions for comparing the stored pressure signal or the temporal derivative of the pressure signal corresponding to said at least two pacing intervals; and

instructions for utilizing a present pacing interval set that includes the at least two pacing intervals that provided the most favorable pressure signal or temporal derivative of the pressure signal when compared in the comparing step.

18. A medium according to claim 17, wherein the pressure signal represents at least a one of: an ePAD metric, a pulse pressure metric, a right ventricular systolic pressure metric, a right atrial systolic pressure metric, a right ventricular diastolic pressure metric, a right atrial diastolic pressure metric.

19. A medium apparatus according to claim 17, wherein the pressure sensor comprises an absolute pressure sensor.

20. A medium according to claim 17, wherein the chamber is a right atrial chamber or a right ventricular chamber.